

How to choose the right path for RTG automation

Why do we need automation?



Safety



Security



Performance



Cost of utilities



Maintenance
and damage

Consistency

- › Predictable
- › Reduces Damages
- › Improves Planning
- › Delivers Accuracy

**Competitive
advantage**

Infra-structure and Operational Requirements

- Ground slope maximum +/- 1% for RTG automation
- Fibre optic network (currently) other solutions (fluidmesh, busbar and 5G are being tested)
- Gaps between containers (400mm)
- Fencing
- Access control systems

Points to Consider

Long term strategy for the automating the terminal including;

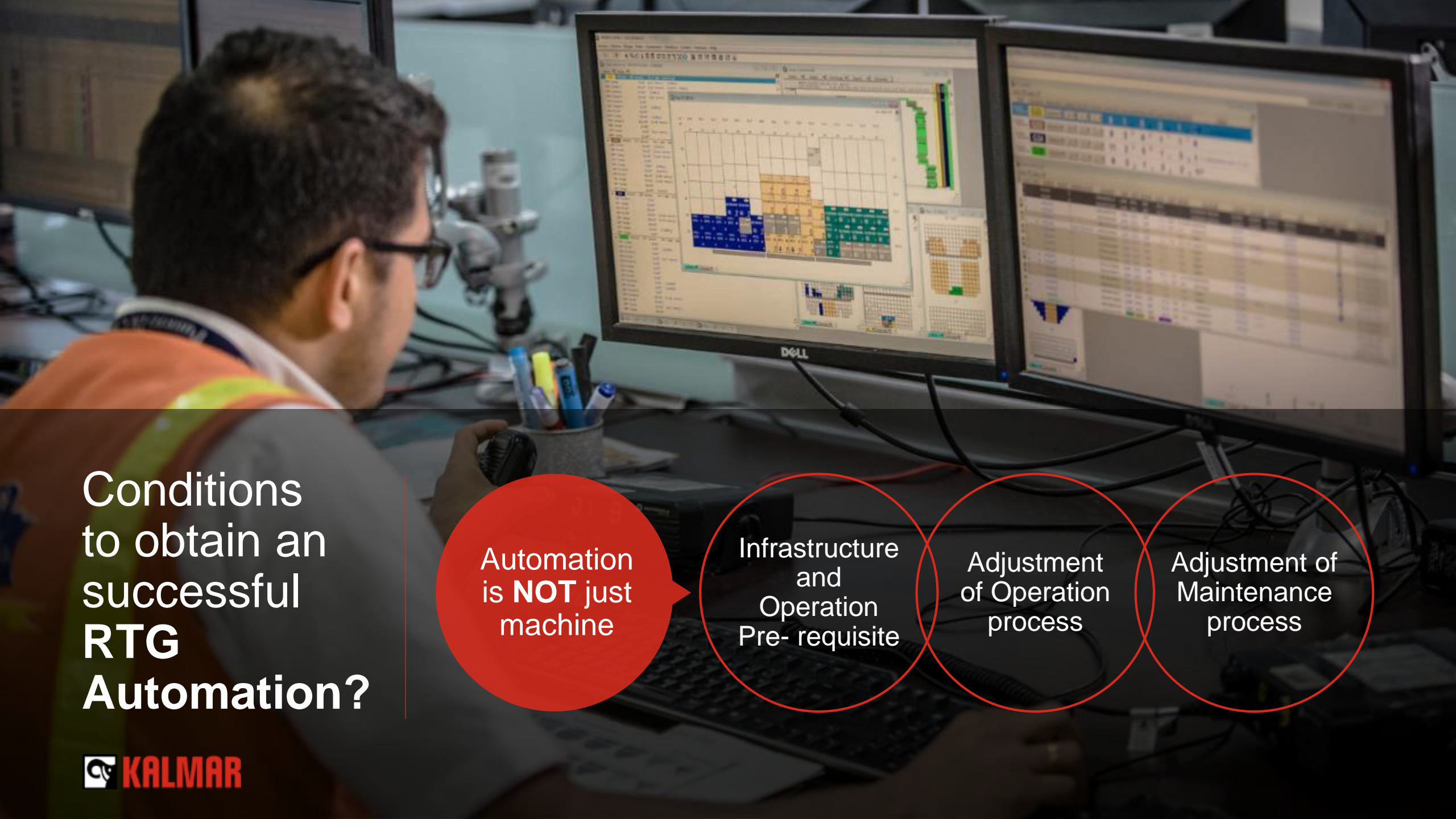
- a) Financial Modelling
- b) Optimization of yard layout

Operational Process

- a) Changes from traditional to automated operation
- b) Maintenance process need to be preventive and periodic.

Labour skill set level

- a) Period needed to adjust for automated operation and maintenance



Conditions
to obtain an
successful
RTG
Automation?

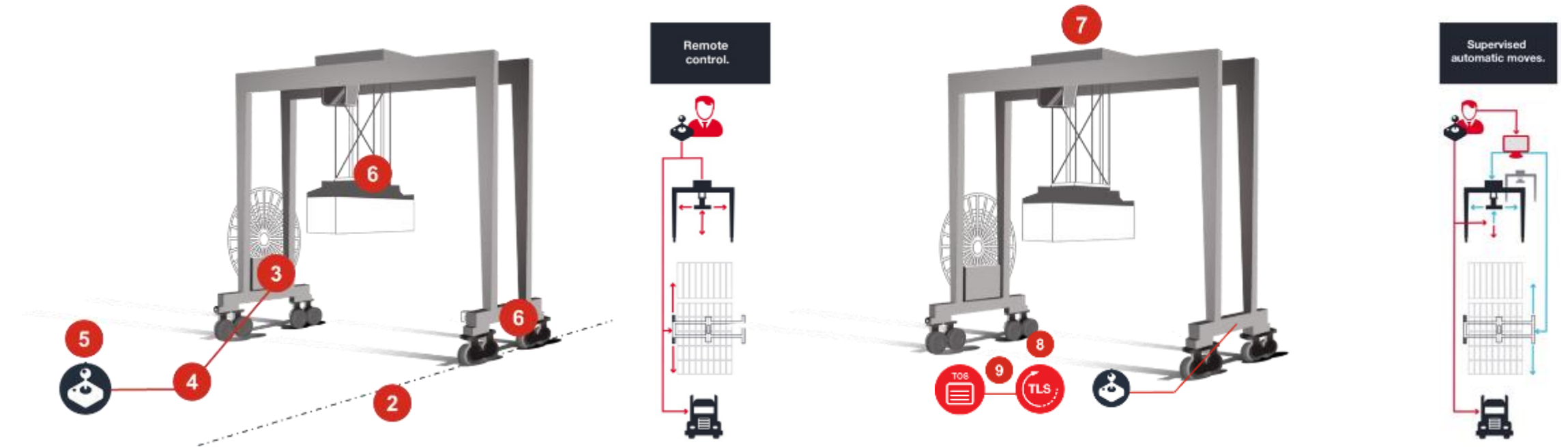
Automation
is **NOT** just
machine

Infrastructure
and
Operation
Pre- requisite

Adjustment
of Operation
process

Adjustment of
Maintenance
process

What are the different level of automation?

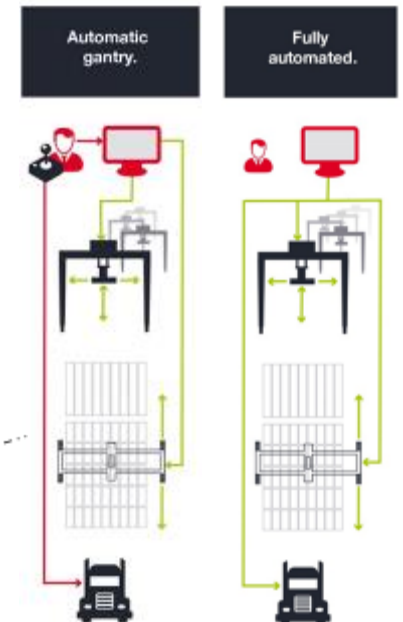
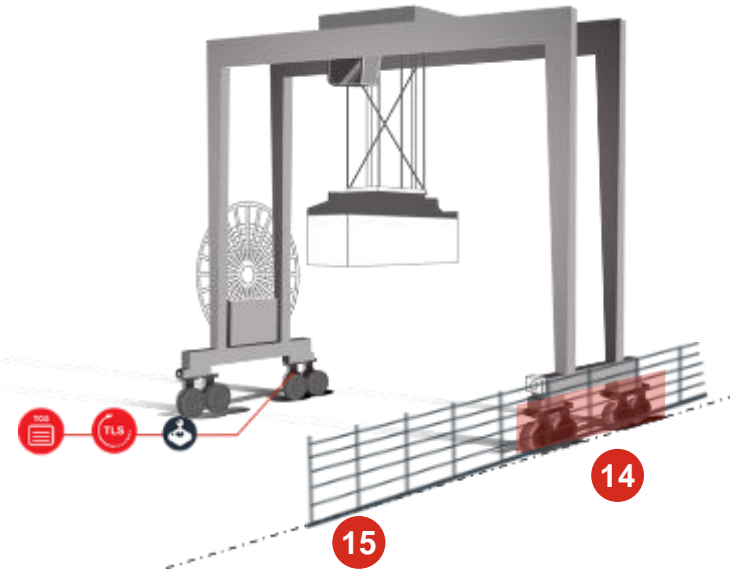
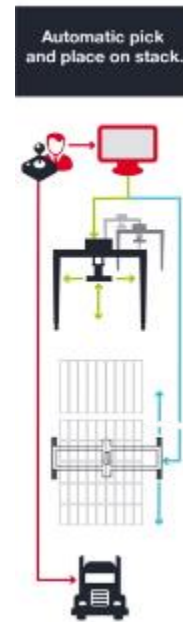
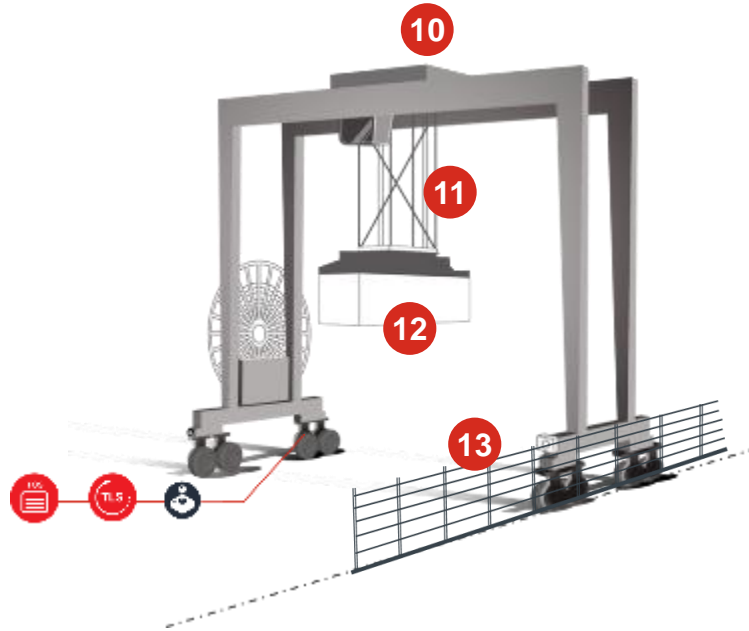


- 1 Crane electrification
- 2 Automatic gantry steering
- 3 Onboard Safety PLC & PC, interface to RTG-PLC
- 4 Data network (cable reel with fibre optics)
- 5 Remote control station with central safety PLC
- 6 Camera system

- 7 Positioning system
- 8 Terminal Logistics System
- 9 Terminal Operating System (TOS) interface

— Remote controlled moves — Supervised moves — Automatic moves

What are the different level of automation?



- 10 Target Position Measurement System (TPMS)
- 11 Load Position Measurement System (LPMS)
- 12 Ability to micro-control the load
- 13 Safe stack area, fences around the stack

- 14 Safe RTG frame
- 15 Redundant gantry positioning system

— Remote controlled moves — Supervised moves — Automatic moves

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